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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,806	03/23/2004	Clement J. Fortin	END920020027US2	2910
7590 06/14/2005			EXAMINER	
John A. Jordan, Esq. 11 Hyspot Road Greenfield Center, NY 12833			DOLAN, JENNIFER M	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/806,806

Applicant(s)

FORTIN ET AL.

Examiner

Jennifer M. Dolan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/23/04 (pre-Amdt).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 18-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/23/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 24 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 24 recites a “contact surface which is generally annular and includes said lower electrical contact portion and said upper electrical contact portion and further includes another contact surface which generally caps said surface which is generally annular.” Since the specification does not anywhere discuss an “annular contact surface”, and since the drawings do not show an annular contact shape (but rather the contact portions appear to be block-shaped), it is not clear to which feature the “annular contact surface” refers. For the purposes of examination, it is assumed that any surface mount capacitor having a “dog-bone” shape (i.e., contact portions encircling the two ends of the capacitor) will meet this limitation.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “annular contact surface” must be shown or the feature canceled from claim 24. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 18 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,579,573 to Baker et al.

Baker discloses an electronic package (figure 4), comprising: a substrate (18) having at least two electrical contacts thereon (wiring board pads on 18 that connect to 16; figure 4), and a passive SMD (14; column 3, lines 10-20) respectively bonded by a solder connection (column 4, lines 20-25; 47-50) to the at least two electrical contacts on the substrate (16; figure 4), the passive SMD encapsulated by a resin (12) such that the space between the passive SMD and the substrate is filled with resin, and the resin forms fillets around the passive SMD solder connection (figure 4).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,238,223 to Cobbley et al. (cited by applicant) in view of U.S. Patent No. 5,128,746 to Pennisi et al. (cited by applicant).

Cobbley discloses an electronic package (figures 1 and 6), comprising: a substrate (14) having at least two electrical contacts (18) thereon (figure 1); and a passive SMD (10; column 8, lines 50-55, 62-64) having at least two electrical contacts (12), each having at least a lower electrical contact portion ('bottom' of 12 in figure 1) and an upper electrical contact portion ('outer side' of 12 in figure 1) with at least the lower electrical contact portion respectively positioned toward the electrical contacts of the substrate (figure 1), and with the lower and upper contact portions bonded by a solder connection to the electrical contacts on the substrate (through 16; column 9, lines 1-5), the passive SMD having a pre-form resin (15) in the space between the passive SMD and the substrate (figure 1). Cobbley further teaches that the capacitor is a "dog-bone" type capacitor (figure 1).

Cobbley fails to disclose that the resin fills the space between the SMD and the substrate, such that the resin forms fillets around the SMD solder connection. Cobbley further fails to disclose that the resin is formed from an epoxy-based flux encapsulant.

Pennisi teaches that an underfill resin should be applied in such a manner that the resin completely fills the area between the SMD and substrate (column 2, lines 30-50), and further forms fillets (260) around the SMD solder connection (figure 2; column 3, lines 45-50). Pennisi further teaches that the adhesive resin is an epoxy-based flux encapsulant (column 3, lines 5-15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the structure of Cobbley, such that the underfill resin is formed from an epoxy-based flux encapsulant that completely fills the space between the SMD and substrate, forming fillets around the solder connections, as suggested by Pennisi. The rationale is as follows: A person having ordinary skill in the art would have been motivated to form the resin

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of Cobbley such that it completely fills the space between the SMD and substrate, forming fillets around the solder connections, because Cobbley notes that the resin is used as a flip chip adhesive underfill (Cobbley, column 8, lines 55-58), and Pennisi shows that a flip chip underfill needs to completely fill the space between the chip and substrate in order to provide maximum environmental protection for the device (Pennisi, column 2, lines 30-50). Furthermore, Pennisi shows that providing an excess of underfill, such that fillets are formed leads to the formation of a continuous seal around the periphery of the device to fully protect and encapsulate the device (Pennisi, column 3, lines 45-50; line 65 – column 4, line 5). A person skilled in the art would further use an epoxy flux encapsulant material as the underfill, because Pennisi shows that such an underfill material provides fluxing action for the solder interconnection, while protecting the device from contamination or the need for extra cleaning steps (see Pennisi, column 3, lines 5-15; 40-67; column 2, lines 1-30). Since Pennisi further suggests that any surface mount component using solder connections may be used as the chip component of Pennisi (see Pennisi, column 3, lines 50-56), it is apparent that the underfill structure of Pennisi could be applied to the surface mount capacitor of Cobbley.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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U.S. Patent Publication No 2003/0170450 to Stewart et al. and U.S. Patent No. 6,409,070 to Master et al. teach that the same chip mounting and underfilling processes can be applied to passive surface mount capacitors that are applied to active ICs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Dolan whose telephone number is (571) 272-1690. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer M. Dolan
Examiner
Art Unit 2813

jmd


CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800